

1 **CLAIMS**

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3 1. An exhaust gas cooler comprising:

4 an external tube arranged on a longitudinal axis
5 and having first and second end walls within said
6 tube, said external tube and end walls defining a
7 coolant chamber between said end walls and first and
8 second exhaust gas chambers outside said first and
9 second end walls respectively,

10 coolant inlet and outlet means communicating with
11 said coolant chamber,

12 a plurality of internal tubes extending from said
13 first end wall to said second end wall and arranged
14 such that the interior of each internal tube
15 communicates with said first and second exhaust gas
16 chambers, and

17 exhaust gas inlet and outlet means
18 communicating with said first and second exhaust gas
19 chambers respectively, whereby the exhaust gas inlet
20 and outlet means are each axially arranged on the
21 longitudinal axis of the external tube;

22 characterised in that the external tube has a
23 cross-sectional shape which has a height in the major
24 axis which is greater than its width in the minor axis
25 perpendicular to the major axis.

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27 2. An exhaust gas cooler according to Claim 1,
28 wherein the cross-sectional shape of the external tube
29 is substantially oval.

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1 3. An exhaust gas cooler according to Claim 1,
2 wherein the cross-sectional shape of the external tube
3 comprises two semi-circles connected by common
4 straight line tangents parallel to the major axis.

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6 4. An exhaust gas cooler according to Claim 1,
7 wherein the internal tubes are circular in cross-
8 section.

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10 5. An exhaust gas cooler according to Claim 1,
11 wherein each internal tube is spaced by the same
12 spacing from its closest neighbouring internal tubes.

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14 6. An exhaust gas cooler according to claim 5,
15 wherein the spacing between adjacent internal tubes is
16 less than 2 mm.

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18 7. An exhaust gas cooler according to claim 5,
19 wherein the spacing between adjacent internal tubes is
20 between 10% and 20% of the diameter of the tubes.

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22 8. An exhaust gas cooler according to Claim 1,
23 wherein the exhaust gas cooler is made from stainless
24 steel.

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26 9. An exhaust gas cooler according to Claim 1,
27 wherein each of the exhaust gas inlet and outlet means
28 comprises a flange plate adapted to connect to a
29 corresponding flange plate on a connecting exhaust

1 pipe and having an aperture therein to permit the
2 through flow of exhaust gases.

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4 10. An exhaust gas cooler according to Claim 1,
5 wherein the coolant inlet and outlet means comprise
6 tubular pipes adapted to be connected to a coolant
7 hose and extending substantially in the plane
8 containing the longitudinal axis of the external tube
9 and the major axis of the cross-section of the
10 external tube.

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12 11. An exhaust gas cooler according to Claim 10,
13 wherein the coolant inlet means is located adjacent to
14 one of the first and second end walls and the coolant
15 outlet means is located adjacent to the other of the
16 first and second end walls.

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18 12. An exhaust gas cooler according to Claim 10,
19 wherein the coolant inlet means is located at one side
20 of the external tube on the major axis and the coolant
21 outlet means is located on the diametrically opposite
22 side of the external tube on the major axis.

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24 13. An exhaust gas cooler according to Claim 1,
25 wherein each of said first and second exhaust gas
26 chambers is further defined by a tapering cylindrical
27 member extending from said aperture to said external
28 tube.